FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

ROUX2 SAMPLE NO.

SG-PACERDL

Lab Name: STL BURLINGTON Contract: 24000

Lab Code: STLVT Case No.: 24000 SAS No.: SDG No.: 100226

Matrix: (soil/water) AIR Lab Sample ID: 571918D1

Sample wt/vol: 50.00 (g/mL) ML Lab File ID: 571918D

Level: (low/med) LOW * DO NOT USE * Date Received: 05/15/04

% Moisture: not dec. _____ CAE 6/25/04 Date Analyzed: 06/10/04

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	2.0	U
108-67-8	1,3,5-Trimethylbenzene	2.0	U
95-63-6	1,2,4-Trimethylbenzene	2.0	U
76-14-2	1,2-Dichlorotetrafluoroethan	2.0	U
106-93-4	1,2-Dibromoethane	2.0	U
106-99-0	1,3-Butadiene	7.8	Ø
75-15-0	Carbon Disulfide	2.0	U
67-64-1	Acetone	89	Ø J
67-63-0	Isopropyl Alcohol	20	U
1634-04-4	Methyl tert-Butyl Ether	2.0	U
110-82-7	Cyclohexane	2.0	U
124-48-1	Dibromochloromethane	2.0	U
78-93-3	Methyl Ethyl Ketone	38	Ø
108-10-1	Methyl Isobutyl Ketone	2.0	U
591-78-6	Methyl Butyl Ketone	2.0	U
75-27-4	Bromodichloromethane	2.0	U
156-60-5	trans-1,2-Dichloroethene	2.0	U
622-96-8	4-Ethyltoluene	2.0	U
95-49-8	2-Chlorotoluene	2.0	U
110-54-3	n-Hexane	3.8	Ø
109-99-9	Tetrahydrofuran	20	U
142-82-5	n-Heptane	2.0	U

CAE 6/25/04

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

ROUX2 SAMPLE NO.

SG-SACCO_A

Lab Name: STL BURLINGTON Contract: 24000

Lab Code: STLVT Case No.: 24000 SAS No.: SDG No.: 100226

Matrix: (soil/water) AIR Lab Sample ID: 571915

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 571915

Level: (low/med) LOW Date Received: 05/15/04

% Moisture: not dec. _____ Date Analyzed: 06/09/04

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.75	
74-87-3	Chloromethane	0.66	
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon TF	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon Tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
1330-20-7	Xylene (m,p)	0.50	U
100-42-5	Styrene	0.50	U
95-47-6	Xylene (o)	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

ROUX2 SAMPLE NO.

SG-SACCO_A

Lab Name: STL BURLINGTON Contract: 24000

Lab Code: STLVT Case No.: 24000 SAS No.: SDG No.: 100226

Matrix: (soil/water) AIR Lab Sample ID: 571915

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 571915

Level: (low/med) LOW Date Received: 05/15/04

% Moisture: not dec. _____ Date Analyzed: 06/09/04

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
106-99-0	1,3-Butadiene	0.50	U
75-15-0	Carbon Disulfide	0.50	U
67-64-1	Acetone	5.0	U
67-63-0	Isopropyl Alcohol	5.0	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
110-82-7	Cyclohexane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
78-93-3	Methyl Ethyl Ketone	0.50 ~~0.71~~	U
108-10-1	Methyl Isobutyl Ketone	0.50	U
591-78-6	Methyl Butyl Ketone	0.50	U
75-27-4	Bromodichloromethane	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
622-96-8	4-Ethyltoluene	0.50	U
95-49-8	2-Chlorotoluene	0.50	U
110-54-3	n-Hexane	0.50	U
109-99-9	Tetrahydrofuran	5.0	U
142-82-5	n-Heptane	0.50	U

CAE 6/25/04

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

ROUX2 SAMPLE NO.

SG-SACCO_B

Lab Name: STL BURLINGTON Contract: 24000

Lab Code: STLVT Case No.: 24000 SAS No.: SDG No.: 100226

Matrix: (soil/water) AIR Lab Sample ID: 571917

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 571917

Level: (low/med) LOW Date Received: 05/15/04

% Moisture: not dec. _____ Date Analyzed: 06/09/04

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.81	
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon TF	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
67-66-3	Chloroform	0.51	
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon Tetrachloride	0.50	U
71-43-2	Benzene	0.76	
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	2.1	
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.61	
1330-20-7	Xylene (m,p)	1.8	
100-42-5	Styrene	0.50	U
95-47-6	Xylene (o)	0.62	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

ROUX2 SAMPLE NO.

SG-SACCO_B

Lab Name: STL BURLINGTON Contract: 24000

Lab Code: STLVT Case No.: 24000 SAS No.: SDG No.: 100226

Matrix: (soil/water) AIR Lab Sample ID: 571917

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 571917

Level: (low/med) LOW Date Received: 05/15/04

% Moisture: not dec. _____ Date Analyzed: 06/09/04

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.68	
76-14-2	1,2-Dichlorotetrafluoroethan	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
106-99-0	1,3-Butadiene	1.4	
75-15-0	Carbon Disulfide	1.1	
67-64-1	Acetone	20	
67-63-0	Isopropyl Alcohol	5.0	U
1634-04-4	Methyl tert-Butyl Ether	0.50 ~~0.51~~	U
110-82-7	Cyclohexane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
78-93-3	Methyl Ethyl Ketone	0.50 ~~2.6~~	U
108-10-1	Methyl Isobutyl Ketone	0.50	U
591-78-6	Methyl Butyl Ketone	0.50	U
75-27-4	Bromodichloromethane	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
622-96-8	4-Ethyltoluene	0.51	
95-49-8	2-Chlorotoluene	0.50	U
110-54-3	n-Hexane	0.57	
109-99-9	Tetrahydrofuran	5.0	U
142-82-5	n-Heptane	0.50	U

CAE 6/25/04

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

ROUX2 SAMPLE NO.

SG-VINING

Lab Name: STL BURLINGTON Contract: 24000

Lab Code: STLVT Case No.: 24000 SAS No.: SDG No.: 100226

Matrix: (soil/water) AIR Lab Sample ID: 571913

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 571913

Level: (low/med) LOW Date Received: 05/15/04

% Moisture: not dec. _____ Date Analyzed: 06/09/04

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.88	
74-87-3	Chloromethane	0.65	
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.77	
76-13-1	Freon TF	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	5.8	
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon Tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.61	
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
1330-20-7	Xylene (m,p)	0.50	U
100-42-5	Styrene	0.50	U
95-47-6	Xylene (o)	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

ROUX2 SAMPLE NO.

SG-VINING

Lab Name: STL BURLINGTON Contract: 24000

Lab Code: STLVT Case No.: 24000 SAS No.: SDG No.: 100226

Matrix: (soil/water) AIR Lab Sample ID: 571913

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 571913

Level: (low/med) LOW Date Received: 05/15/04

% Moisture: not dec. _____ Date Analyzed: 06/09/04

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
106-99-0	1,3-Butadiene	0.50	U
75-15-0	Carbon Disulfide	0.50	U
67-64-1	Acetone	5.0	
67-63-0	Isopropyl Alcohol	5.0	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
110-82-7	Cyclohexane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
78-93-3	Methyl Ethyl Ketone	0.50	U
108-10-1	Methyl Isobutyl Ketone	0.50	U
591-78-6	Methyl Butyl Ketone	0.50	U
75-27-4	Bromodichloromethane	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
622-96-8	4-Ethyltoluene	0.50	U
95-49-8	2-Chlorotoluene	0.50	U
110-54-3	n-Hexane	4.1	
109-99-9	Tetrahydrofuran	5.0	U
142-82-5	n-Heptane	0.50	U

TRILLIUM INC.

ATTACHMENT C

MASS SPECTRA FOR INCORRECTLY IDENTIFIED PEAKS
SDG #100226
Volatiles in Soil Gas - IndustriPlex
Samples Collected May 13-14, 2004

Data File: /chem/V.i/Vsvr.p/vefto15.b/571912.d

Date : 09-JUN-2004 03:12

Client ID: SG-ABC ROOFING

Instrument: V.i

Sample Info: SG-ABC ROOFING :[J05/13/04 @0815(Air)

Purge Volume: 200.0

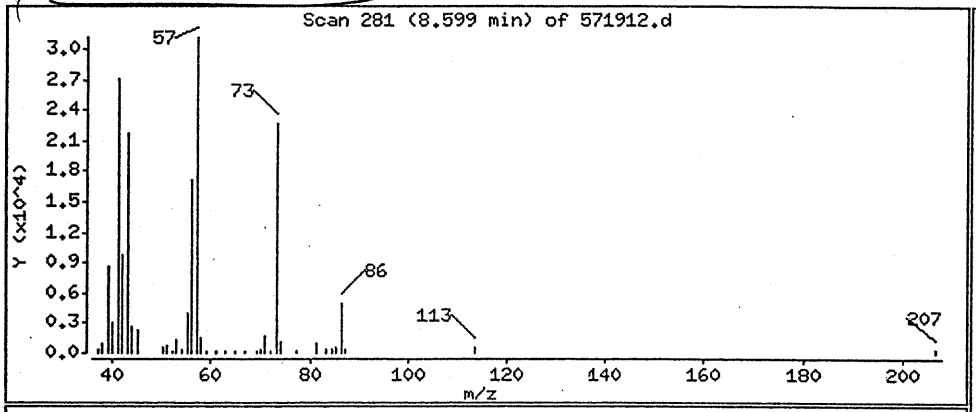
Operator: dmw

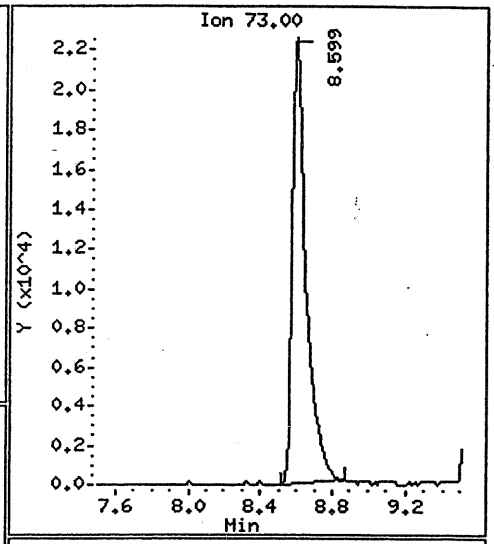
Column phase: RTX-624

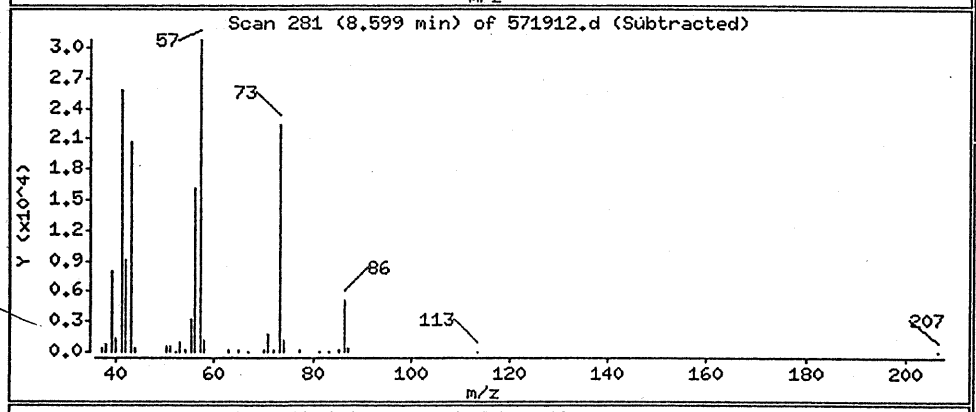
Column diameter: 0.32

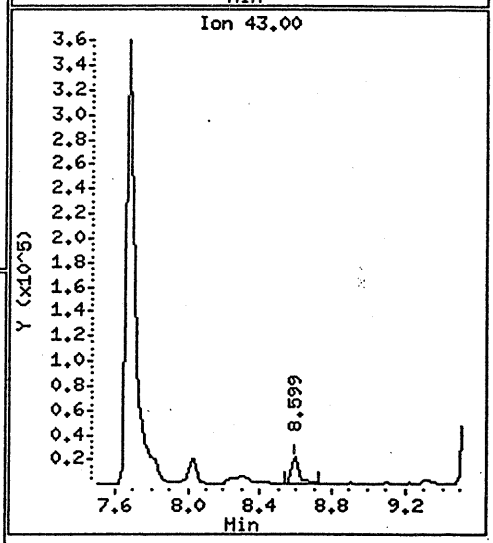
18 Methyl tert-Butyl Ether

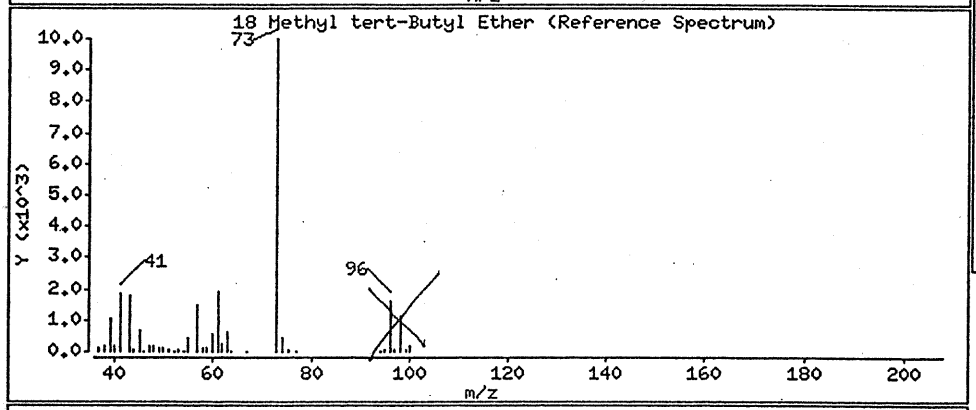
Concentration: 3.4 ppbv

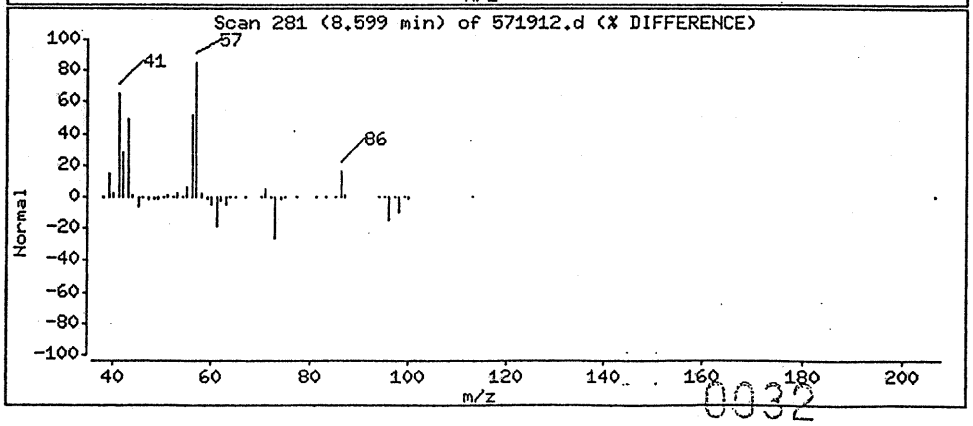












Data File: /chem/V.i/Vsvr.p/vefto15mod.b/571912.d

Date : 09-JUN-2004 03:12

Client ID: SG-ABC ROOFING

Instrument: V.i

Sample Info: SG-ABC ROOFING :[ ]05/13/04 @0815(Air)

Purge Volume: 200.0

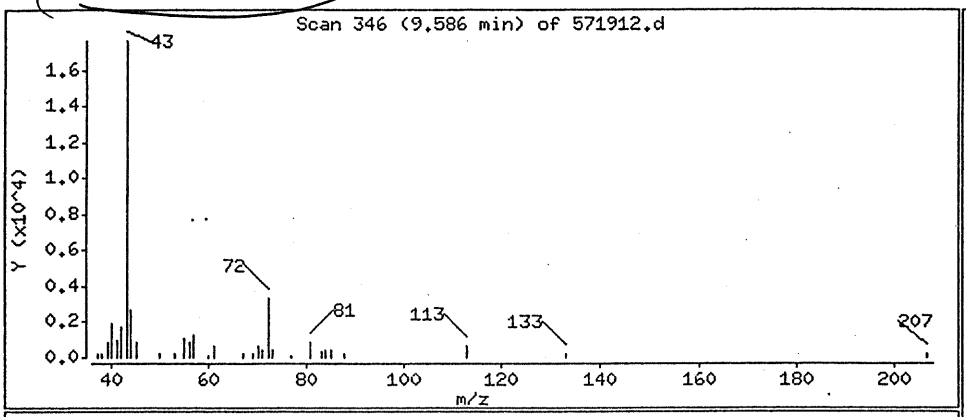
Operator: dmw

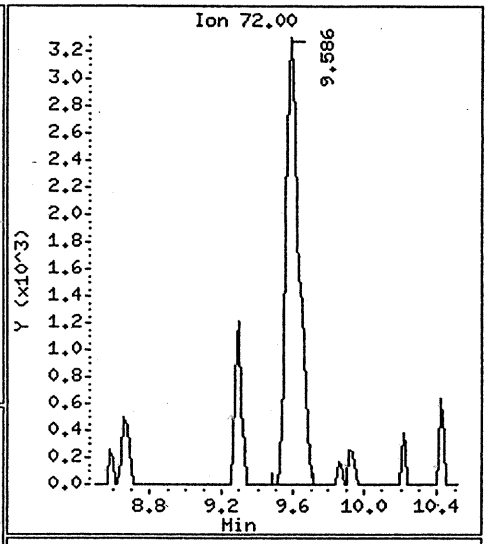
Column phase: RTX-624

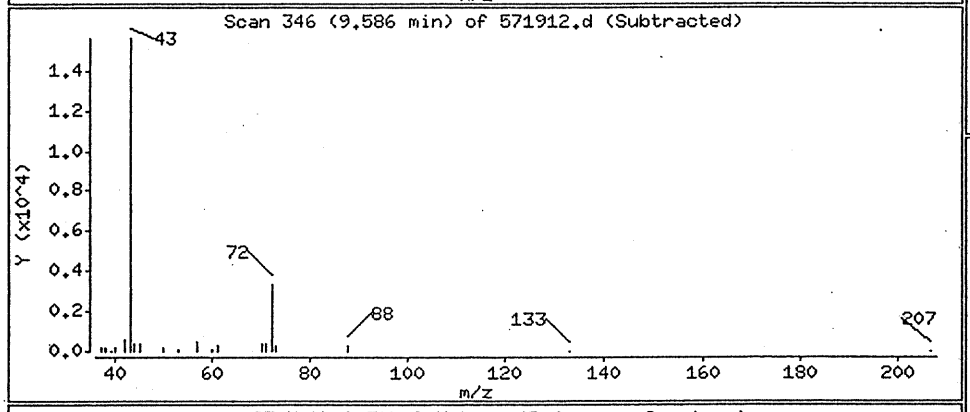
Column diameter: 0.32

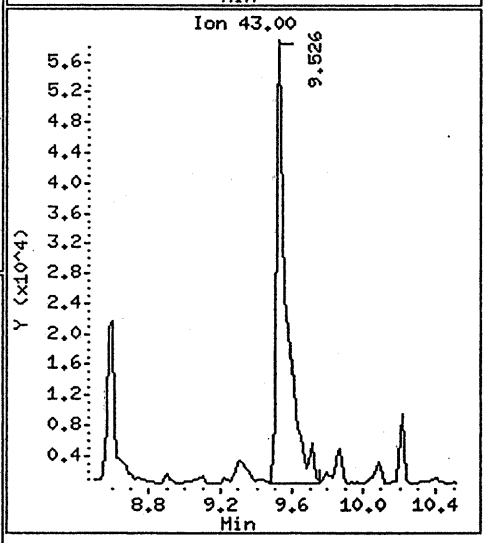
23 Methyl Ethyl Ketone

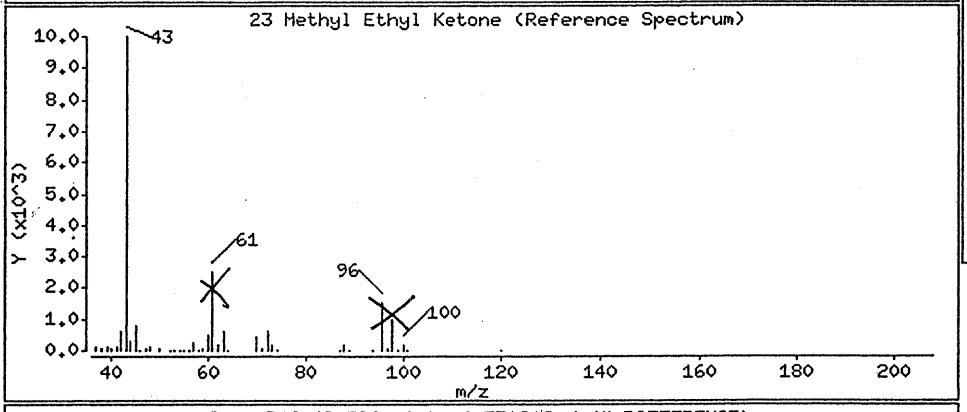
Concentration: 2.4 ppbv

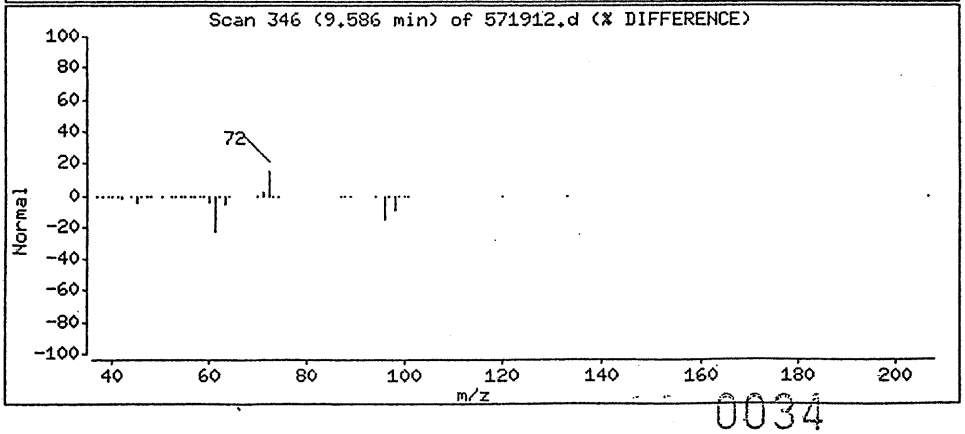












Data File: /chem/V.i/Vsvr.p/vefto15mod.b/571914.d

Date : 09-JUN-2004 04:41

Client ID: SG-GANGLIANI

Instrument: V.i

Sample Info: SG-GANGLIANI :[05/13/04 @1005(Air)

Purge Volume: 200.0

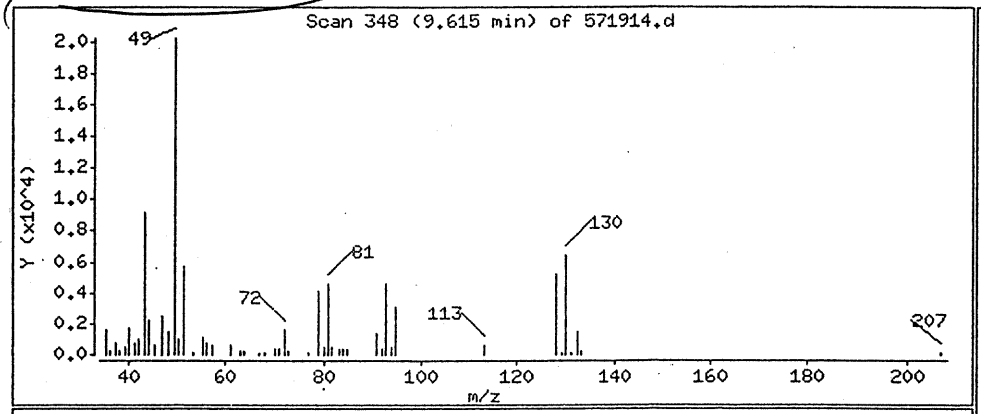
Operator: dmw

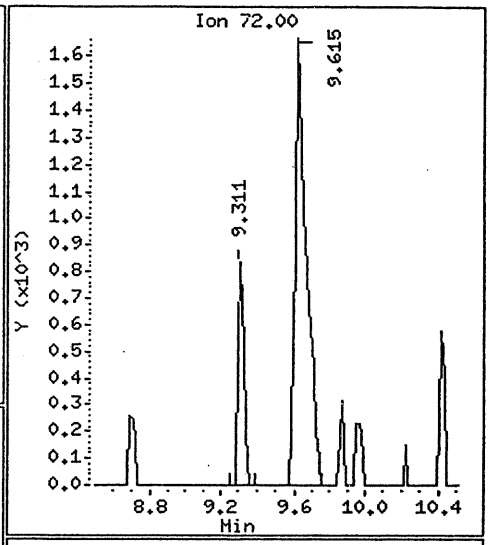
Column phase: RTX-624

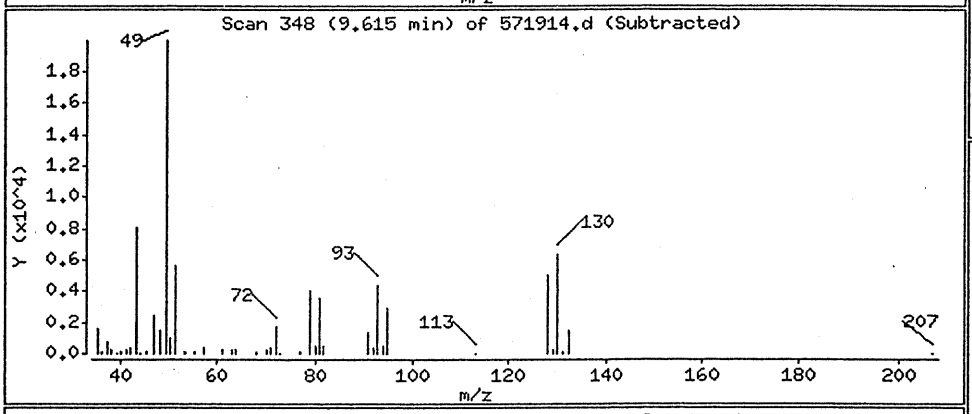
Column diameter: 0.32

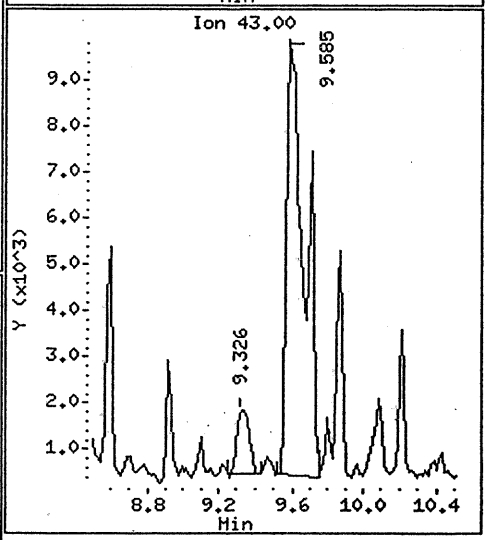
23 Methyl Ethyl Ketone

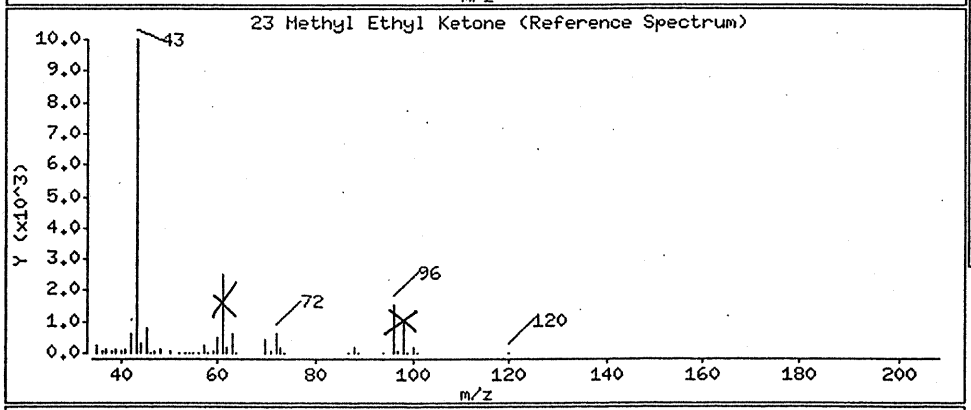
Concentration: 1.2 ppbv

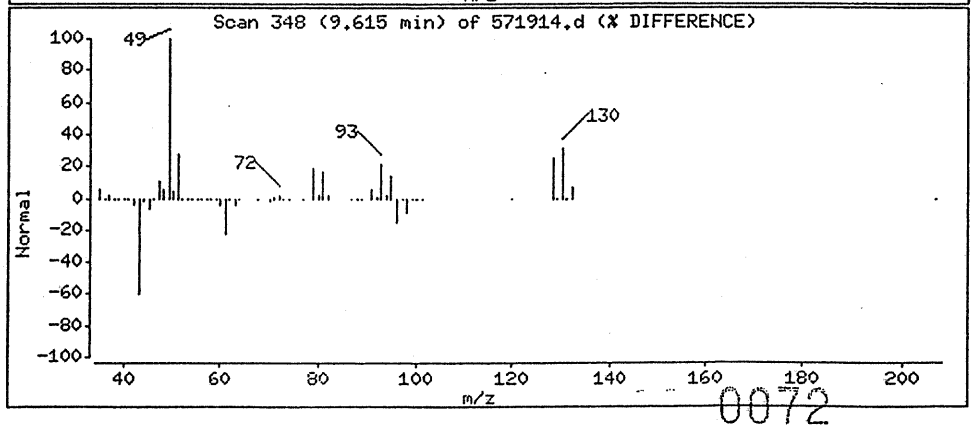












0072

Data File: /chem/V.i/Vsvr.p/vefto15mod.b/571916.d

Date : 09-JUN-2004 06:12

Client ID: SG-GRAPHIQUE

Instrument: V.i

Sample Info: SG-GRAPHIQUE :[ ]05/13/04 @1320(Air)

Purge Volume: 200.0

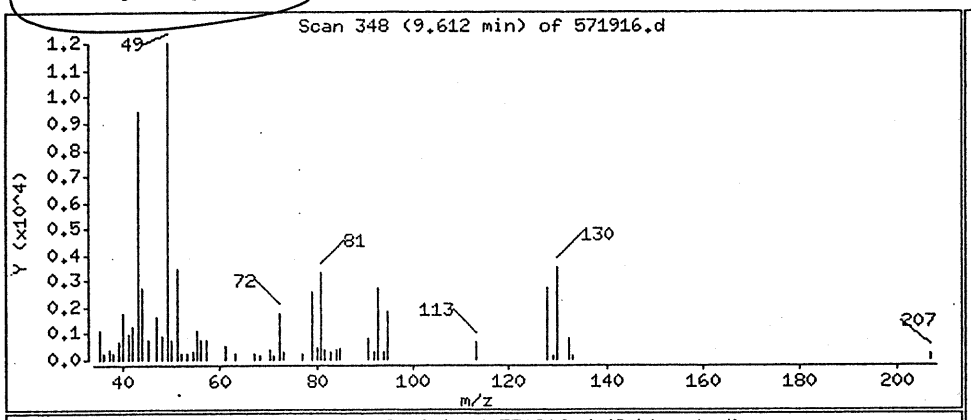
Operator: dmw

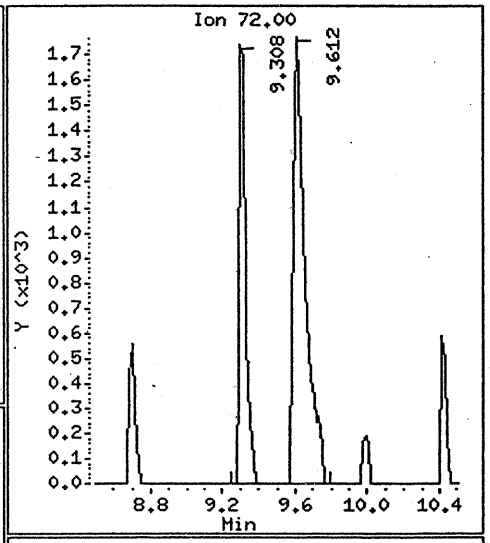
Column phase: RTX-624

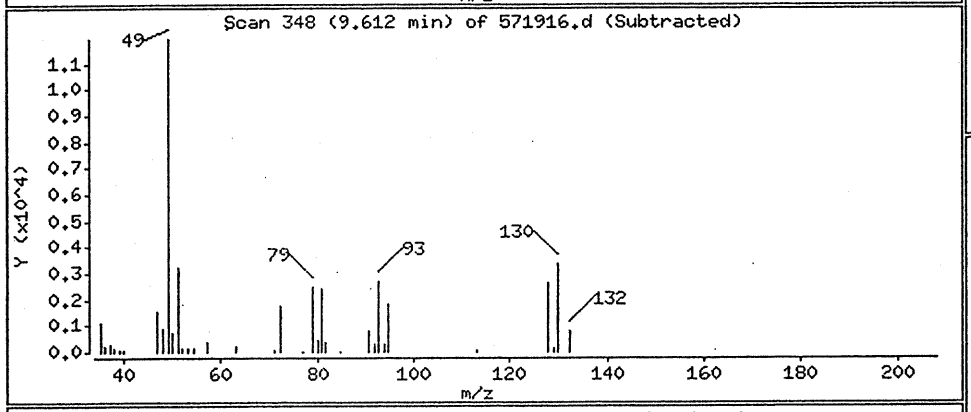
Column diameter: 0.32

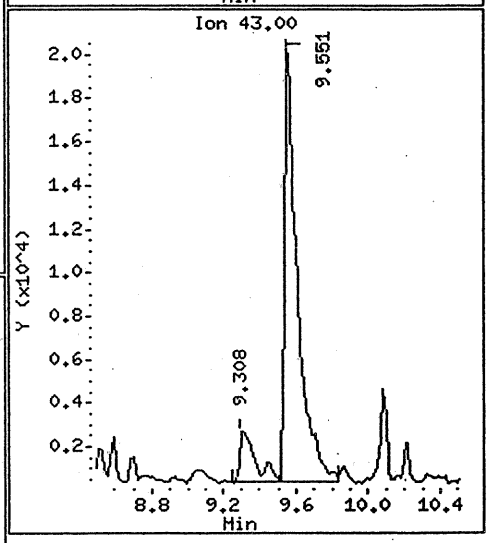
23 Methyl Ethyl Ketone

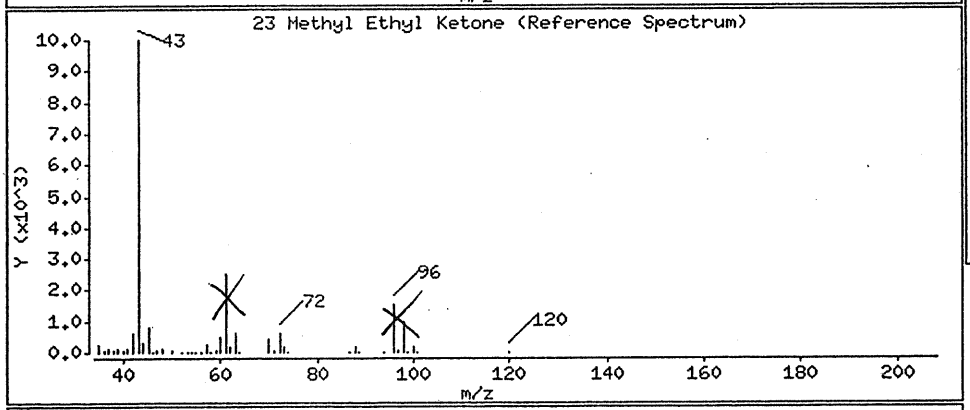
Concentration: 1.3 ppbv

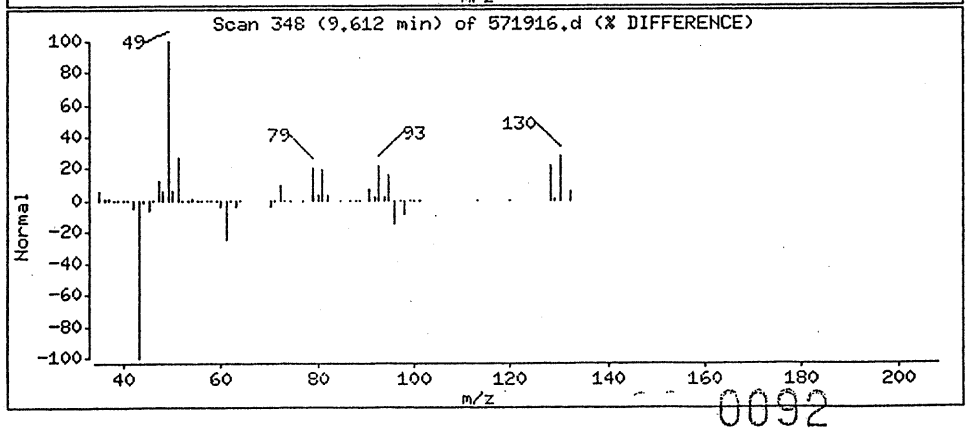












Data File: /chem/V.i/Vsvr.p/vefto15mod.b/571915.d

Date : 09-JUN-2004 05:26

Client ID: SG-SACCO_A

Instrument: V.i

Sample Info: SG-SACCO_A :[ ]05/13/04 @1125(Air)

Purge Volume: 200.0

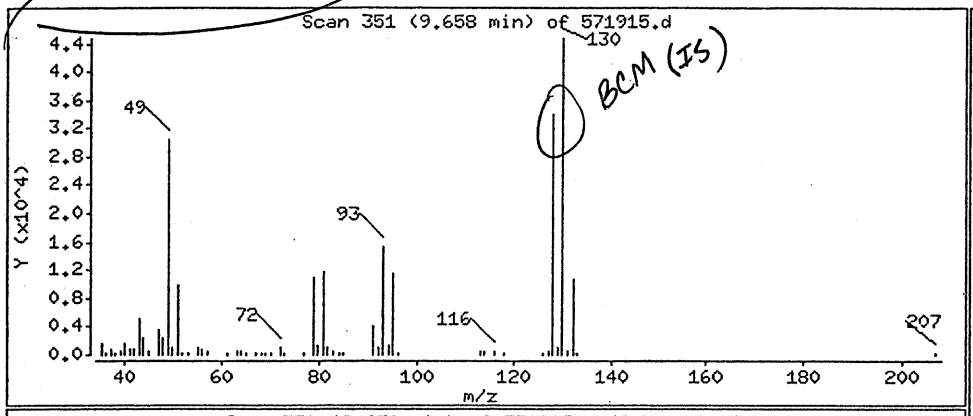
Operator: dmw

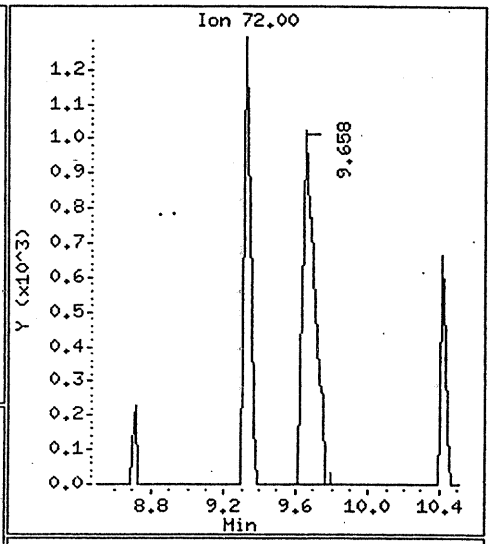
Column phase: RTX-624

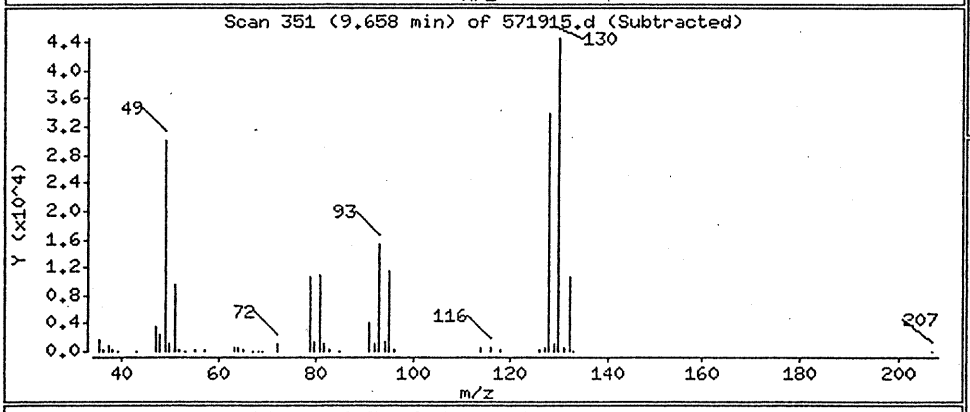
Column diameter: 0.32

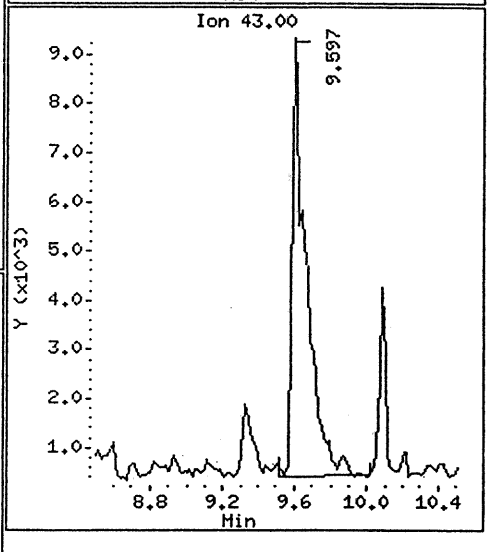
23 Methyl Ethyl Ketone

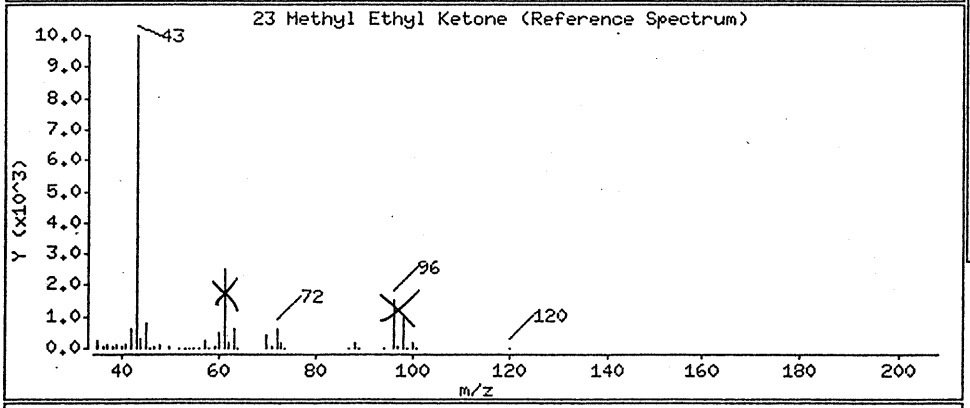
Concentration: 0.71 ppbv

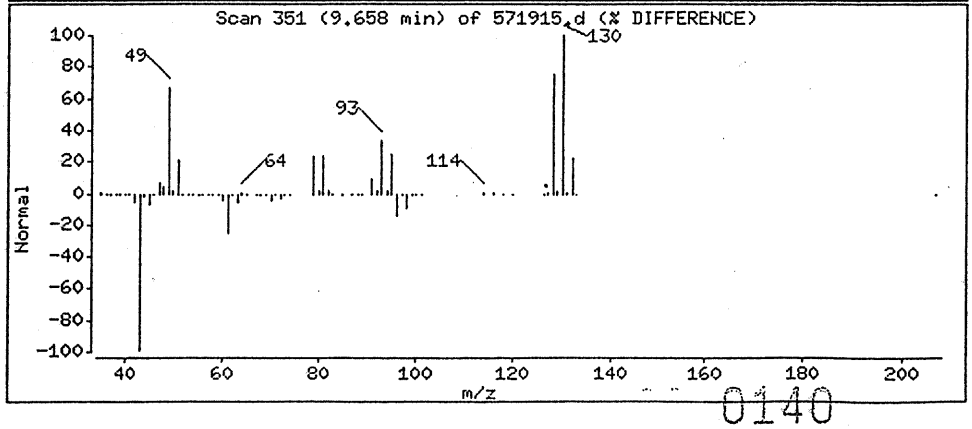












Data File: /chem/V.i/Vsvr.p/vefto15.b/571917.d

Date : 09-JUN-2004 06:58

Client ID: SG-SACCO_B

Instrument: V.i

Sample Info: SG-SACCO_B :[ ]05/13/04 @1345(Air)

Purge Volume: 200.0

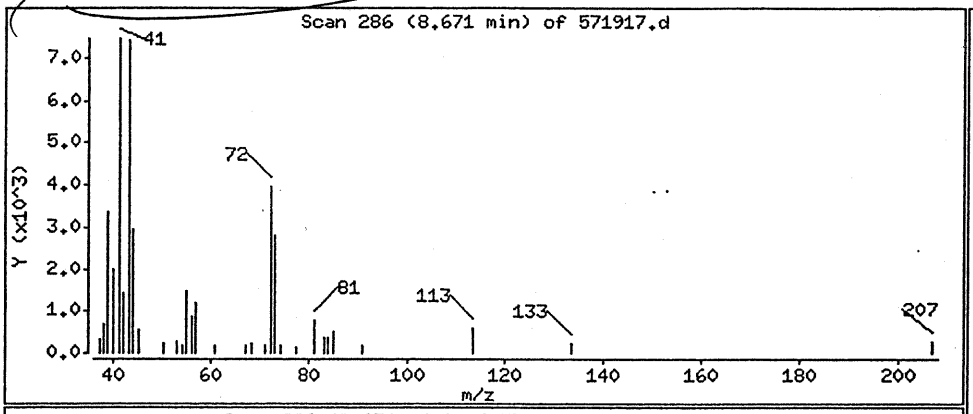
Operator: dmw

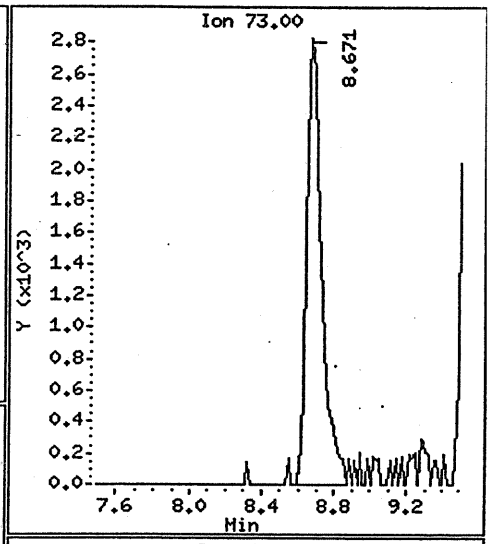
Column phase: RTX-624

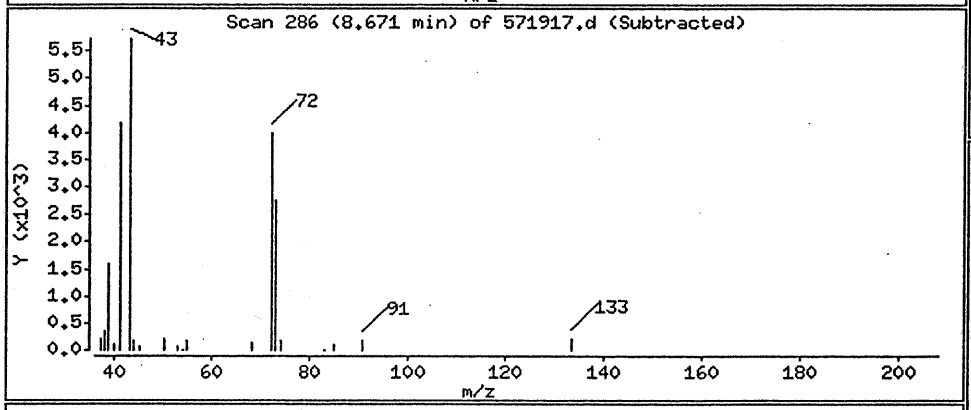
Column diameter: 0.32

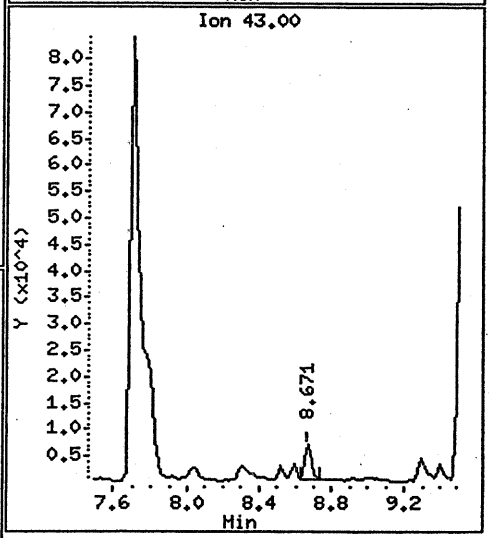
18 Methyl tert-Butyl Ether

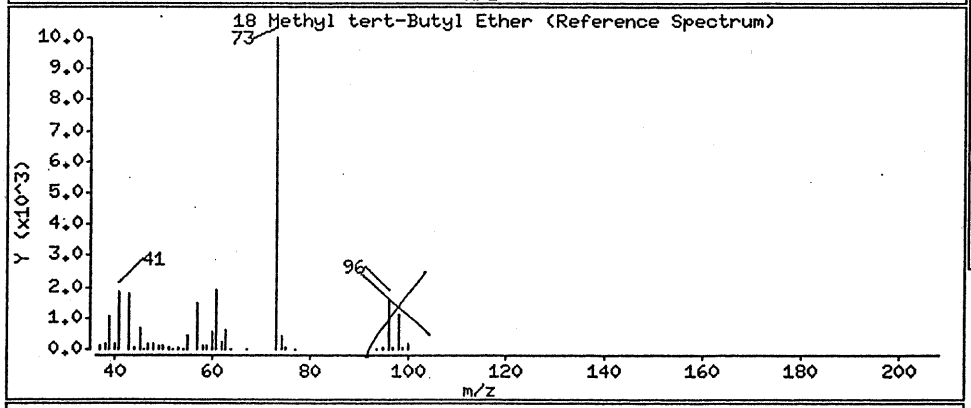
Concentration: 0.51 ppbv

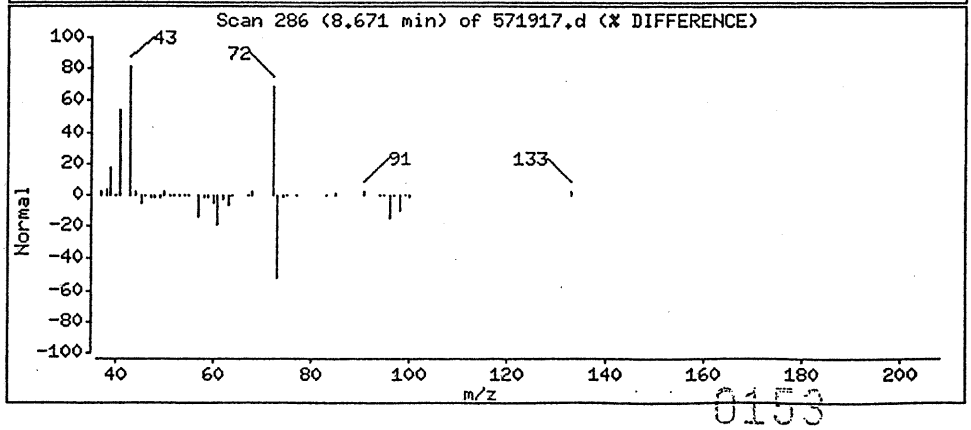












Data File: /chem/V.i/Vsvr.p/vefto15mod.b/571917.d

Date : 09-JUN-2004 06:58

Client ID: SG-SACCO_B

Instrument: V.i

Sample Info: SG-SACCO_B :[05/13/04 @1345(Air)

Purge Volume: 200.0

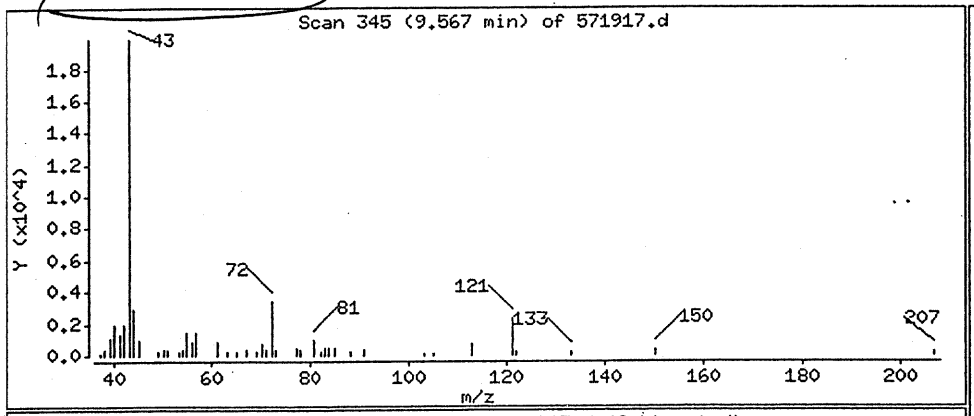
Operator: dmw

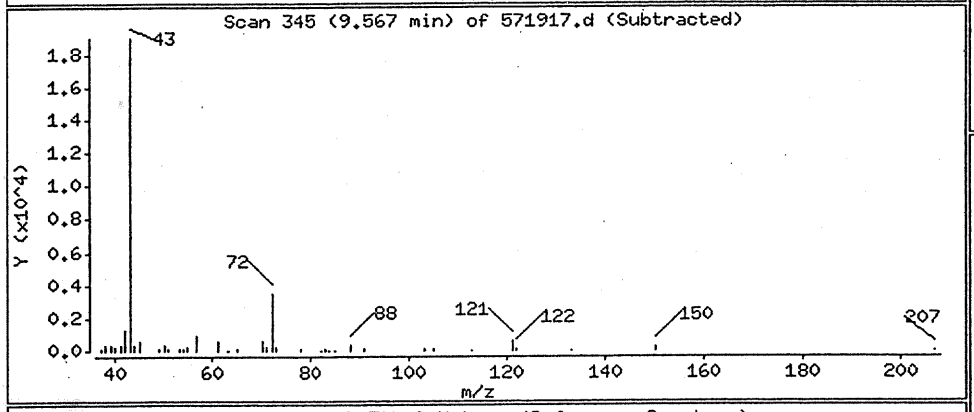
Column phase: RTX-624

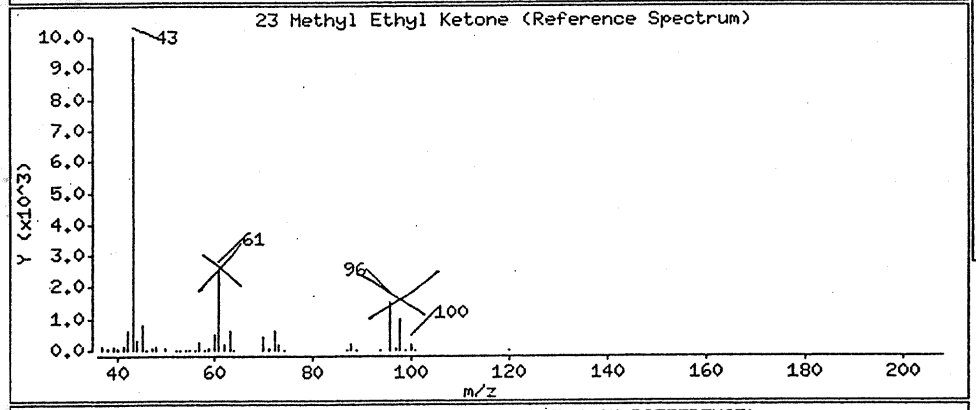
Column diameter: 0.32

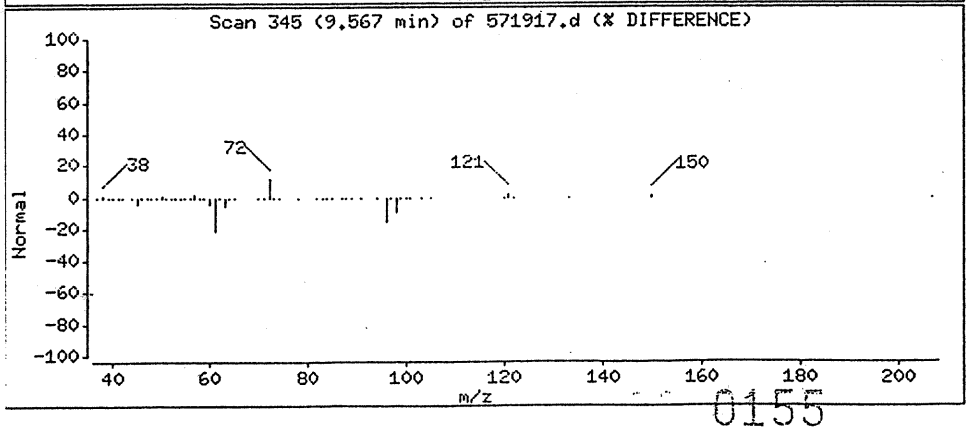
23 Methyl Ethyl Ketone

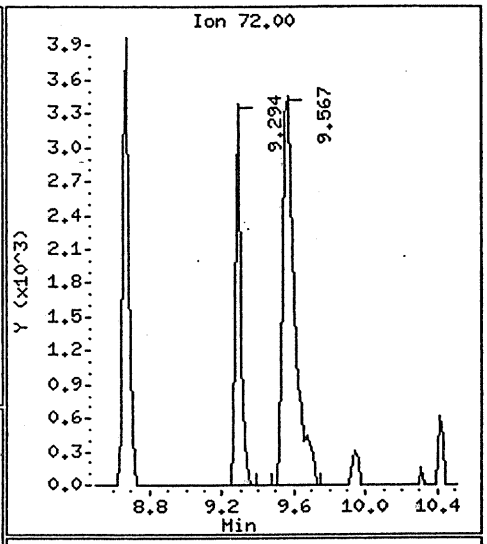
Concentration: 2.6 ppbv

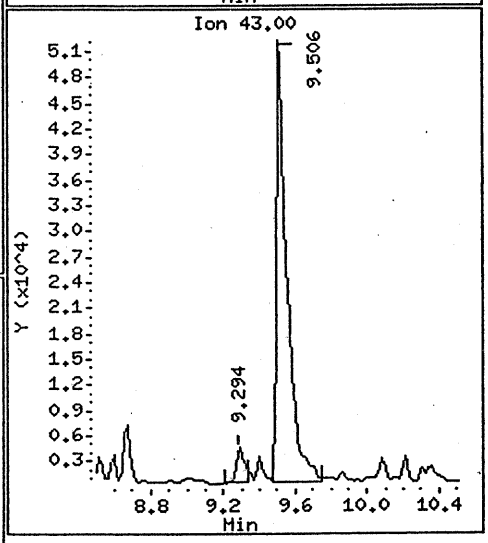












TRILLIUM INC.

DATA VALIDATION

FOR

INDUSTRIPLEX PROJECT
WOBURN, MASSACHUSETTS

ORGANIC ANALYSIS DATA
Volatile Organics in Soil Gas
Sample Delivery Group #100862
June 2004 Sample Collections

Chemical Analyses Performed by:

Severn Trent Laboratories
Colchester, Vermont

FOR

Roux Associates, Inc.
Burlington, Massachusetts

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 13, 2004

04864\CAE\DAS
Industriplex/Soil Gas/100862 voc

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the volatile organics analysis data prepared by Severn Trent Laboratories (STL Burlington) for two soil gas samples and a trip blank collected in association with the IndustriPlex project in Woburn, Massachusetts, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) #100862, which was received for review on July 8, 2004. The following samples were reported:

SG-TERADYNE	SG-TERADYNE-DUP
TRIP BLANK	

Throughout this report, the suffix "DL" is used to distinguish the diluted re-analysis of a sample (e.g., SG-TERADYNEDL) from the original, undiluted analysis of the sample.

Based on the validation effort, reported sample results were qualified as follows:

- Results for 2-chlorotoluene in all reported sample analyses were qualified as estimated (UJ).
- Results for methylene chloride in SG-TERADYNE and SG-TERADYNE-DUP were qualified as estimated (J, UJ).
- Results for dichlorodifluoromethane, chloromethane, chloroethane, trichlorofluoromethane, acetone, carbon disulfide, isopropyl alcohol, n-hexane, methyl ethyl ketone, cyclohexane, benzene, n-heptane, and trichloroethene in SG-TERADYNE were qualified as estimated (J).
- Results for trichlorofluoromethane, acetone, carbon disulfide, isopropyl alcohol, n-hexane, and methyl ethyl ketone in SG-TERADYNEDL were qualified as estimated (J).

All "D" qualifiers applied by the laboratory were removed by the validator.

For SG-TERADYNE, the undiluted analysis results are recommended for use and only these results have been reported on the data summary form in Attachment A. The Form I for SG-TERADYNEDL in Attachment B has been marked "Do Not Use" for clarity.

Methyl ethyl ketone[1] was detected in a sample of the modeling clay used as a sealant during sample collection as well as in three of the nine soil gas samples collected in May and June, 2004. Although no sample results were qualified by the validator, the data user is cautioned that the source and/or concentration of methyl ethyl ketone in the soil gas samples where it was detected cannot be confirmed.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV) of this report. Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XIII.

This validation report should be considered part of the data package for all future distributions of these volatiles data.

[1] Methyl ethyl ketone is referred to as 2-butanone in the EPA 8260 data package in which the modeling clay data are reported.

INTRODUCTION

Analyses were performed according to U.S. EPA Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)," January 1999 (EPA 625/R-96/010b). Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

To the extent possible, Trillium's validation was performed in conformance with the "Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analysis, 12/96. Where discrepancies were observed between the criteria presented in the validation guidelines and the method specifications, the method specifications took precedence. Professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis. This requires that the data package contain sufficient raw data documentation to facilitate the validation effort and allow verification of the reported results. It is assumed that the data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by Region I:

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

J - The associated numerical value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

R - The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.

These codes are recorded on the data summary form in Attachment A and the laboratory's Volatile Organics Analysis Data Sheets (Form Is) in Attachment B to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported result is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected results should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The soil gas samples were collected on 6/12/04. All sample analyses were performed on 7/1/04 and 7/2/04, which is within the 30-day holding time specified by the referenced method.

The laboratory's Log-In Sheet indicates that the samples were received intact and with intact custody seals on 6/19/04. The shipping container was at ambient temperature; no preservation is required for air samples collected in canisters.

II. GC/MS Instrument Performance Checks

Three instrument performance checks using bromofluorobenzene (BFB) were run, representing all shifts (24-hour periods) during which samples, associated standards, and/or associated quality control samples were analyzed. Results for all three instrument performance checks were acceptable.

III. Calibration

Sample analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as "V." A few target analytes were manually integrated in some of the calibration standards associated with this data set. The documentation provided verifies that these integrations were acceptably performed and accurately incorporated into the applicable quantitation reports. No internal standard or surrogate compounds were manually integrated in any of the calibration standards.

A. Initial Calibration (IC)

One five-point, ambient purge IC was established on 6/29/04 in support of the reported analyses. Standards at concentrations of 0.50, 5.0, 10, 20, and 40 parts per billion by volume (ppbv) were analyzed for all of the target analytes. For hexachlorobutadiene and 1,2,4-trichlorobenzene, a 15 ppbv standard was included and the 40 ppbv standard was dropped, establishing a calibration range of 0.50 ppbv to 20 ppbv for these two analytes. For acetone, isopropyl alcohol, and tetrahydrofuran, a 15 ppbv standard was included and the 0.50 ppbv standard was dropped, establishing a calibration range of 5.0 ppbv to 40 ppbv for these three analytes. Documentation of all individual IC standards analyzed was present in the data package. Relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported in all cases.

The 15 ppbv standard used for the five target analytes listed above also included the other target analytes at this concentration, but the 15 ppbv results for these analytes were not included in

the initial calibration. While it is acceptable to drop the high or low concentration standard responses, exclusion of responses from the middle of the calibration curve is not an acceptable practice, and should not be continued by the laboratory. Based on validator calculations, RRFs from the 15 ppbv standard were consistent with the established IC, and their inclusion would not likely have made a significant difference in the reported sample results. Therefore, based on professional judgment, no action was taken on this basis.

Average RRF values reported by the laboratory were above the applicable minimum acceptance criterion (0.05) and %RSD values were below the maximum acceptance criterion (30%) for all target analytes except 2-chlorotoluene (31.6%). Per the validation guidelines, results for 2-chlorotoluene in all reported sample analyses were qualified as estimated (UJ) based on the high %RSD value for this analyte.

B. Continuing Calibration (CC)

All samples and associated quality control analyses were analyzed in association with two continuing calibration standards run on 7/1/04 and 7/2/04. Both CC standards were fully documented in the data package.

All RRF and percent difference (%D) values were correctly calculated and accurately reported for both CC standards. All RRFs were above the minimum acceptance criterion (0.05) and all %D values were below the maximum acceptance limit (30%) except for 1,3,5-trimethylbenzene (36.2%) and 2-chlorotoluene (30.5%) on 7/1/04 and 1,3,5-trimethylbenzene (39.4%) on 7/2/04.

All of the unacceptably high %D values listed above reflect increased analyte responses in the CC standards relative to the IC, suggesting the potential for reporting false positives or for positive results that are biased high. 1,3,5-Trimethylbenzene and 2-chlorotoluene were not detected in any of the samples in this data set. Therefore, based on professional judgment, no sample results were qualified based on the high %D values for these analytes in the CC standards.

IV. Blanks

Two laboratory method blanks (MBs: ABLKB1 and ABLKB3) were analyzed in association with the soil gas samples. No target analytes were detected in either MB.

One trip blank (TRIP BLANK) was submitted to the laboratory with this set of samples. A pre-evacuated canister was taken to the site and returned to the laboratory with the soil gas samples; at the laboratory, it was filled with blank air and then analyzed. No target analytes were detected in this trip blank.

A sample of the modeling clay used to seal the sampling probe at the floor surface during collection of the samples in this data set was also submitted for analysis of volatile organics by EPA

Method 8260. Results of this analysis were validated separately, and are discussed in a separate validation report. One analyte detected in the clay sample was not a target analyte for the TO-15 analyses (acrylonitrile). 1,1-Dichloroethene was detected in the clay (260 ppb) but was not found in any of the soil gas samples collected in May (SDG #100226) or June. Methyl ethyl ketone (referred to as 2-butanone in the EPA 8260 data package) was detected in the clay (14 ppb) and in three of the May/June soil gas samples (2.0 ppbv to 39 ppbv). However, there is no way to relate the concentration of this analyte in the clay to the concentrations found in the soil gas samples. Therefore, although no qualifiers were applied by the validator, the data user is cautioned that the source and/or concentration of methyl ethyl ketone in the soil gas samples where it was detected cannot be confirmed.

Canister cleaning certification data for three canister batches were provided in the data package. Canister numbers 6722, 6597, and 6524 were analyzed after cleaning. Canister #6597 was used to collect sample SG-TERADYNE-DUP. The canisters used to collect SG-TERADYNE and TRIP BLANK were included in the other two canister cleaning batches. Associated tuning, calibration, and method blank data for all three canister certification batches were documented in addition to the canister analyses. All three tested canisters were free of contamination, and all associated quality control data were acceptable.

V. Surrogate Recoveries

The use of a surrogate compound is not addressed in Method TO-15, and no surrogate compound was employed with the analyses of these samples.

VI. Laboratory Control Samples (LCSs)

Two 10 ppbv laboratory control sample pairs (B1LCS/LCSD and B3LCS/LCSD) were associated with the reported samples. Both LCS/LCSD pairs were spiked with all target analytes. All target analyte recoveries were within the 70-130% acceptance limits specified by the laboratory on the summary forms in the data package with the following exceptions:

B1LCS:	1,2,4-trichlorobenzene - 180% hexachlorobutadiene - 140% 1,3,5-trimethylbenzene - 140%
B1LCSD:	1,2,4-trichlorobenzene - 200% hexachlorobutadiene - 160% 1,3,5-trimethylbenzene - 140%
B3LCS:	1,2,4-trichlorobenzene - 170%

B3LCSD: 1,2,4-trichlorobenzene - 160%
hexachlorobutadiene - 140%
1,3,5-trimethylbenzene - 150%

All of the recoveries listed above are unacceptably high, suggesting the potential for reporting false positives or for positive results that are biased high. None of these analytes were detected in any of the site samples. Therefore, no sample results were qualified based on the high LCS/LCSD recoveries.

Reproducibility between paired concentrations was acceptable (0-31 relative percent difference [RPD]; QC ≤40 RPD) for all target analytes in both LCS/LCSD pairs.

VII. Field Duplicate

SG-TERADYNE-DUP was identified as a field duplicate of SG-TERADYNE. True duplicates are not feasible for air samples; these paired samples were collected in series from the same soil gas location, with SG-TERADYNE-DUP immediately following SG-TERADYNE. Based on professional judgment, a maximum acceptance limit of 100 RPD was used to define acceptable agreement between reported results in the paired field duplicate samples. Results with RPD values greater than 100 RPD should be used with caution as the concentration and source of these compounds in the reported samples is uncertain.

Undiluted and 2-fold dilution analysis results were reported for SG-TERADYNE, while only undiluted analysis results were reported for SG-TERADYNE-DUP. The following evaluation is based on comparison of the undiluted analysis results for both samples only.

Acceptable reproducibility was demonstrated for dichlorodifluoromethane (5 RPD), chloromethane (17 RPD), chloroethane (5 RPD), trichlorofluoromethane (8 RPD), benzene (22 RPD), trichloroethene (22 RPD), toluene (9 RPD), ethylbenzene (17 RPD), m,p-xylenes (4 RPD), styrene (25 RPD), o-xylene (0 RPD), 1,2,4-trimethylbenzene (4 RPD), carbon disulfide (68 RPD), acetone (6 RPD), isopropyl alcohol (10 RPD), cyclohexane (0 RPD), methyl ethyl ketone (0 RPD), 4-ethyltoluene (0 RPD), n-hexane (5 RPD), and n-heptane (11 RPD).

Methylene chloride was detected just above the reporting limit (RL) in SG-TERADYNE-DUP (0.51 ppbv) but was not found in SG-TERADYNE (0.50 ppbv U). Based on professional judgment, results for methylene chloride were qualified as estimated (J, UJ) in SG-TERADYNE and SG-TERADYNE-DUP due to this lack of confirmation at a very low concentration.

VIII. Internal Standard Performance

Internal standard areas were within the method-specified quality control limits (area ±40% of the corresponding CC standard area) in the reported sample and quality control analyses except for IS#1 (bromochloromethane, 157%) and IS#3 (1,4-difluorobenzene, 149%) in SG-TERADYNE. According to the analysis run log, this sample was re-analyzed (without dilution) with similar results; the data for this second analysis were not reported. SG-TERADYNE was then re-analyzed again at a two-fold dilution. Only IS#1 was very slightly high (140.5%) in the diluted sample analysis. Both the original undiluted analysis and the two-fold dilution analysis were reported in the data package.

Per the validation guidelines, results for detected target analytes that are associated with an unacceptably high IS response must be qualified as estimated (J). The following sample results were so qualified:

- Dichlorodifluoromethane, chloromethane, chloroethane, trichlorofluoromethane, acetone, carbon disulfide, isopropyl alcohol, n-hexane, methyl ethyl ketone, cyclohexane, benzene, n-heptane, and trichloroethene in SG-TERADYNE; and

- Trichlorofluoromethane, acetone, carbon disulfide, isopropyl alcohol, n-hexane, and methyl ethyl ketone in SG-TERADYNEDL.

All internal standard retention times (RTs) were within the method-specified quality control limits (RT ±0.33 minutes of the corresponding CC standard RT) for all reported sample and quality control analyses.

IX. Target Compound Identification

All reported target analytes in all samples were correctly identified with acceptable supporting mass spectra present in the data package.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations and sample-specific RLs were correctly calculated and accurately reported by the laboratory, including adjustments for dilutions where applicable. All "D" qualifiers applied by the laboratory to the results for detected analytes in SG-TERADYNEDL were removed by the validator.

Comparison of the concentrations of target analytes detected in both the undiluted and diluted analyses of SG-TERADYNE showed excellent reproducibility. Four analytes detected at low

concentrations in the undiluted analysis (dichlorodifluoromethane, chloromethane, chloroethane, and 1,2,4-trimethylbenzene) were diluted out and not found in the dilution. However, two analytes not found in the undiluted analysis (methyl isobutyl ketone and methyl butyl ketone) were detected above the adjusted RL in the dilution; this suggests that these analytes may represent contamination from an unknown source, rather than true sample components. In general, IS areas tended to be in the upper half of the acceptable ranges in all of the sample and quality control analyses in this data set. The following IS areas were reported for the three soil gas sample analyses and the associated trip blank:

Sample	IS#1	IS#2	IS#3
CC-7/1/04	*196072*	*859176*	*863432*
SG-TERADYNE	308010	1186672	1282355
TRIP BLANK	243248	910176	1023072
CC-7/2/04	*213170*	*916870*	*925818*
SG-TERADYNEDL	299404	1131082	1247332
SG-TERADYNE-DUP	284314	1106641	1186731

For SG-TERADYNE, there is no significant difference between the actual IS responses in the undiluted, diluted, and field duplicate analyses; slight differences in the IS areas in the associated CC standards essentially determined whether they were within or outside the acceptance limits. High recoveries (>100%) were also observed for several target analytes in the LCS/LCSD analyses, with several exceeding the acceptance limits (Section VI).

Based on all the available data and professional judgment, the undiluted analysis results for SG-TERADYNE are recommended for use, and only these results have been reported on the data summary form. The Form I for SG-TERADYNEDL has been marked "Do Not Use" for clarity.

The unadjusted RLs reported by the laboratory for each target analyte are equal to the lowest IC standard concentration associated with these sample analyses. These values are well supported by the raw data.

The data summary form in Attachment A lists all individual sample analytes affected by the applied qualifications. All positive results are listed on this form, whether or not the value or qualifier was changed as a result of the validation. Where no result is listed, the compound was not detected and the RL was not qualified. Sample-specific RLs may be found on the laboratory-generated Form I for each sample (Attachment B) or may be calculated from the information on the data summary form as follows: unadjusted RL (far left column) multiplied by the dilution factor.

XI. Tentatively Identified Compounds (TIC)

Library searches of non-target compound peaks are not required by the referenced method and were not requested for these samples.

XII. System Performance

The GC/MS system appears to have been working satisfactorily at the time of these analyses, based on review of the available raw data.

XIII. Documentation

A copy of the field COC record listing all site samples was provided in the data package; the following issues were noted:

- The container type used for sample collection was not specified; "P/O," defined as "plastic/other" was recorded. The use of canisters should be clearly documented on the COC record.

- The soil gas samples were collected on 6/12/04 but were not shipped to the laboratory until 6/18/04. The disposition of the samples during the time period between collection and shipment was not documented in the data package.

These issues do not directly affect the validity of the analytical data generated. However, they could be problematic if the data were to be used for litigation.

XIV. Overall Assessment

Results for volatile organics in the soil gas samples reported in SDG #100862 were determined to be valid as reported with the following exceptions:

- Results for 2-chlorotoluene in all reported sample analyses were qualified as estimated (UJ) based on an unacceptably high %RSD value for this analyte in the associated initial calibration.

- Based on professional judgment, results for methylene chloride in SG-TERADYNE and SG-TERADYNE-DUP were qualified as estimated (J, UJ) due to lack of confirmation at a very low concentration in the paired field duplicate samples.

- Results for dichlorodifluoromethane, chloromethane, chloroethane, trichlorofluoromethane, acetone, carbon disulfide, isopropyl alcohol, n-hexane, methyl ethyl ketone, cyclohexane, benzene, n-heptane, and trichloroethene in SG-TERADYNE were qualified as estimated (J) based on an unacceptably high response for the associated internal standard compound in this analysis.

- Results for trichlorofluoromethane, acetone, carbon disulfide, isopropyl alcohol, n-hexane, and methyl ethyl ketone in SG-TERADYNEDL were qualified as estimated (J) based on an unacceptably high response for the associated internal standard compound in this analysis.

All "D" qualifiers applied by the laboratory were removed by the validator.

Methyl ethyl ketone was detected in a sample of the modeling clay used as a sealant during sample collection as well as in three of the nine soil gas samples collected in May and June, 2004. Although no sample results were qualified by the validator, the data user is cautioned that the source and/or concentration of methyl ethyl ketone in the soil gas samples where it was detected cannot be confirmed.

For SG-TERADYNE, the undiluted analysis results are recommended for use and only these results have been reported on the data summary form. The Form I for SG-TERADYNEDL in Attachment B has been marked "Do Not Use" for clarity.

Documentation issues are discussed in Section XIII.

This validation report should be considered part of the data package for all future distributions of these volatiles data.

TRILLIUM INC.

ATTACHMENT A

DATA SUMMARY FORM
SDG #100862
Volatiles in Soil Gas - IndustriPlex
Samples Collected June 12, 2004

CLICK TO CONTINUE

DATA SUMMARY FORM: VOLATILES 1
SOIL GAS SAMPLES
parts per billion by volume (ppbv)

Site Name: IndustriPlex

Sampling Date: June 12, 2004

SDG #100862

Trillium Project No. 04864

	Sample Number	SG-TERADYNE		SG-TERADYNE-DUP		TRIP BLANK											
	Lab ID	576334		576335		576336											
	Dilution Factor	1.0		1.0		1.0											
RL																	
0.50	Dichlorodifluoromethane	0.59	J	0.62													
0.50	Chloromethane	0.58	J	0.69													
0.50	Vinyl chloride																
0.50	Bromomethane																
0.50	Chloroethane	0.58	J	0.61													
0.50	Trichlorofluoromethane	7.9	J	8.6													
0.50	Freon TF																
0.50	1,1-Dichloroethene																
0.50	Methylene chloride		UJ	0.51	J												
0.50	1,1-Dichloroethane																
0.50	cis-1,2-Dichloroethene																
0.50	Chloroform																
0.50	1,1,1-Trichloroethane																
0.50	Carbon tetrachloride																
0.50	Benzene	0.91	J	0.73													
0.50	1,2-Dichloroethane																
0.50	Trichloroethene	5.1	J	4.1													
0.50	1,2-Dichloropropane																
0.50	cis-1,3-Dichloropropene																
0.50	Toluene	7.1		6.5													
0.50	trans-1,3-dichloropropene																
0.50	1,1,2-Trichloroethane																
0.50	Tetrachloroethene																
0.50	Chlorobenzene																
0.50	Ethylbenzene	1.3		1.1													
0.50	m,p-Xylenes	4.7		4.5													
0.50	Styrene	1.8		1.4													
0.50	o-Xylene	1.4		1.4													
0.50	1,1,2,2-Tetrachloroethane																
0.50	1,3-Dichlorobenzene																

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